

ROBERT A. GEARHEART

EDUCATION

- Ph.D. Civil Engineering University of Oklahoma, 1969,
Professor George Reid
M.S. Civil Engineering- University of Oklahoma, 1965,
Professor George Reid
B.A. Biology and Mathematics- North Texas State University, 1964,
Dr. J. K. G. Silvey

Professional Engineer – Registered Civil Engineer State of California –C 38158

EMPLOYMENT EXPERIENCE

- 1975- Emeritus Professor, Department of Environmental Resources Engineering, Humboldt State University, Arcata, California, undergraduate engineering instruction water quality, low cost water and wastewater treatment, water and wastewater treatment, hazardous waste management. Co-Director of International Development Technology Program Graduate Program. Research wetland treatment systems for domestic effluent and water reclamation, non-point source pollution marsh treatment system, use of wetlands for denitrification and perchlorate reduction, role of wetland restoration and watershed management, use of conjunctive watershed/lake models to manage eutrophication, surf zone and ocean monitoring, solid and hazardous waste management, and environmental impact analysis. Advising graduate students, Engineering, Biology, Geology and International Development, Faculty Advisor for HSU's Chapter of Engineers Without Borders
- 1971-1975 -Associate Professor, Division of Environmental Engineering, Utah State University, undergraduate and graduate instruction, research, statewide extension program, water supply, water reclamation, wastewater treatment and solid waste management, spray irrigation of waste effluent.
- 1970-1971 -Engineer-Manager, Beaver Water District, Regional Water Supply System, Northwest Arkansas (one-half time). Design, operation, personnel and fiscal tasks associated with 10 MGD plant.
- 1968-1971 -Assistant Professor of Civil Engineering; University of Arkansas-Undergraduate and graduate courses in Sanitary Engineering-Research in eutrophication and water quality modeling, and biological treatment processes.

ORGANIZATIONS/AFFILIATIONS

American Water Works Association-Life member
Water Environment Federation
International Water Association
Society of Wetland Scientists
Sierra Club
Audubon Society

RESEARCH AND CONSULTING EXPERIENCE

- 2007 Humboldt Bay Harbor and Recreation District, Community member on 5 years strategic master plan-water quality and harbor natural resources
- 2007 Worldbank, Wastewater Management Master Plan, Dhaka, Bangladesh, Mike 11 Model
- 2006 Guizhou Province, China, Feasibility Plan for Use of Constructed Wetland to Treat Refinery Waste and to Restore Wetland Habitat, Sino-US Prosper in Peace Association
- 2006 Conceptual Design of Wetland System to Treat Domestic and Agricultural Wastewater, Lake Qarun, Fayoum, Egypt, Montgomery Watson Harza Engineering
- 2005-Present Hatfield Science Team, USFWS-Klamath Falls, Oregon
- 2005 City of Cumberland, B.C., Design of Constructed Wetland to treat Domestic Wastewater
- 2004 City of Fort Bragg, California, Wetland Treatment Conceptual Plan for Redevelopment of the Georgia /Pacific Industrial Site
- 2003 Technical Review Team for Malibu Lagoon Restoration Plan-Heal the Bay/California Coastal Conservancy
- 2003-Present Review Bureau of Reclamation Flow Studies for the Klamath River-Yurok Tribal Council

2003	Wetland restoration design Caledonia Marsh, Klamath Falls Oregon, USFWS
2004	Wetland design, agricultural runoff, K and K Ranch, Klamath Falls, Oregon USFWS
2004	Treatment Wetland Design for Collins Products, Klamath Falls, Oregon
2004-Present	Public Utility Commission, City and County of San Francisco, Technical Review Team, Water Reuse and reclamation, technical selection process for wastewater treatment systems
2001 –2003	Fish and Wildlife Service-Klamath Falls Oregon-Wetland design-agricultural runoff/habitat
2002	Santa Clara Valley Water District – Water reuse wetland application.
2002	DeForest Park Wetland Design – Long Beach, CA Coastal Conservancy.
2001-Present	Colorado Lagoon – Long Beach, CA. Non-point source pond/wetland treatment system.
2001	Port Authority, City/County San Francisco, CA. Non-point source Master Plan
2001	Status of the Science White Paper, Klamath River Basin, Hader Foundation, New York, NY
2001	American Red Cross, Honduras, Design of Wetland Treatment systems for two re-settlement communities- Ciudad Espana and Colonia Cruz Roja
2000	USAID/Harza Engineering , El-Fayoum, Egypt, Middle Egypt Water and Sanitation Master Plan, Lake Quran, Maadi, Egypt. Low cost wastewater treatment (wetlands), Lake water quality, waste load allocation, and stream modeling.
2000	City of Petaluma, California – Value Engineering- Review of Facility Plan, specific input dealing with low cost treatment and reuse options, Carollo engineering, walnut Creek, Ca.
2000	City/County of Phoenix, Az., Review Design and operation and maintenance requirements for the full scale effluent polishing, habitat enhancement, water reclamation wetland system.
1999-present	Use of Constructed Wetlands to treat perchlorate contaminated groundwater (denitrification/perchlorate reduction), Apache Nitrogen Products, Benson, Arizona, Super Fund Project, Hargis and Associates, Tucson, Arizona.
1999-Present	National Recreational Area – Page, Arizona. Wahweap wetland treatment reuse system in conjunction with Parson's Engineering, Phoenix, Arizona.
1999-Present	City of Willits, California, Wetland Treatment -Effluent Disposal and Treatment Upgrade Plan, Larry Moran, Water and Wastewater Supervisor.
1998-Present	City of Willits, California, Effluent Management Plan and Pond-Wetland Treatment Design
1998	USAID/World Bank - Estuarine Restoration Use of Expert System to Choose Appropriate Wastewater Technologies - Recife, Brazil.
1999-Present	Collins Wood Forest Products, Klamath Falls, Oregon, Bureau of Reclamation/Fish and Wildlife Service Wetland Restoration Initiative, Travis Huntley, CWP
1998-Present	Warm Beach Christian Camp – Stanwood, Washington. Wetland treatment with effluent reuse, in conjunction with H. R. Esvelt Engineering, Bainbridge Island, Washington.
1997-Present	World Bank - working with an International consulting firm combined with local engineering firms on a World Bank wastewater treatment project in Recife, Brazil. This includes assessing the capability of natural systems, wetlands and mangrove swamps to treat wastewater for protection of natural systems.
1997-Present	Department of Justice , Couer D' Alene, Idaho - Expert Witness-US Department of Justice - analysis of restoration techniques and monitoring methods and expert analysis of water quality and watershed contaminant loading issues associated with mining -Super Fund Project
1997	West Valley Sanitation District, Coachella Valley, Ca. – Wetland Treatment design-ENARTEC Engineers, Bill Imus, San Diego, Ca.
1997	USEPA -Prepared the Draft <u>Free Surface Constructed Wetland Design Manual</u> , Cincinnati USEPA, Jim Kriessl.
1997	USEPA/ETI - City of Phoenix, 1997, Technology Prepare Draft <u>Technology Assessment of Constructed Wetlands</u> , Review and evaluation of constructed free surface constructed wetlands to treat domestic wastewater. Paul Kinshella, City/County of Phoenix Az. Water and Wastewater Division.
1997	Finalize the WAWTTAR decision support software for USAID/EHP for selecting appropriate wastewater/water reclamation technologies. Utilization of an expert system to compare wetland treatment system with conventional treatment systems. Craig Hafner Environmental Health Project, Arlington, Virginia.
1997	Technical Review Team, California State University San Luis Obispo Campus Center for

- Alternative and Innovative Water, Wastewater, Energy, and Solidwaste Management-Wetland Treatment Component.
- 1996-1997 **The Nature Conservancy of Oregon** - Project manager for developing a restoration plan for the Williamson River at Upper Klamath Lake, Oregon. Five thousand acres of diked and drained wetlands converted to riverine, riparian, and wetland values and functions, Mark Stern, TNC, Portland.
- 1996-Present **City and County of San Francisco**, California Public Utility Commission Technical Review Committee for Alternative Source Reduction, Source Control, Wastewater/CSO treatment, and Wastewater reuse options for watershed management masterplan.
- 1996 **Korea/KAWACO** - Consultant for Harza Engineering working with SunJin Engineers in designing a constructed wetland to treat non-point source pollution and untreated domestic wastewater, Dr. B.K. Lee, Harza Engineering, Chicago, Ill.
- 1996 -Arcata, California Design and construction of a free surface constructed wetland to treat animal waste from a 200 head dairy in Humboldt County.
- 1996 -Dinuba, California - **Odwalla Corporation** - 1996. Assist in the design of a closed loop water, wastewater, energy, and solid waste system for a juice company concerned with a wide range of environmental and community issues related to food processing industries. Includes a wetland treatment process of industrial wastewater.
- 1996 -Initiative to Combat Desertification, **World Bank** - Tunisia
Assist in the design and implementation of a workshop to evaluate wastewater treatment/reuse options in arid and semi-arid countries. Included use of constructed wetlands - Jordan, Egypt, Tunisia, Israel, and Palestinian National Authority.
- 1996 -**Palau Republic** - Winzler and Kelly Engineers and Engineering Science Parsons. Presented three seminars to local decision makers concerning the use of constructed wetlands to treat domestic wastewater. Prepared a basis for design report for the use of constructed wetlands for Karor, Palau to protect nearshore receiving water within the barrier reef.
- 1995 -**USAID/EHP Project**, Design-Gaza City- Evaluation of wastewater wetland for water reclamation.
- 1995 -Del Norte County, CA. Solidwaste Management Authority, Assessment of and Treatment Alternatives for a Landfill Leachate Hazardous Waste.
- 1995 -Anacortes, Washington, Constructed Wetland Treatment System, HDR Engineers, Seattle Washington.
- 1994 -**EPA Region 9/Bechtel Engineering**, Apache Powder Super Fund Site - Use of Constructed Wetlands to Treat Contaminated Groundwater. Dentrifying wetland system.
- 1994 -**Bureau of Reclamation** - Klamath Lake, Oregon - Use of Constructed Wetlands to Reduce Phosphorus Loading to Hyper Eutrophic Lake, Watershed Model, Reservoir Model, Pilot Projects.
- 1994 -**City of Phoenix, Arizona** - Technical Review Team for Use of Constructed Wetlands to Polish Activated Sludge Effluent for Discharge into the Tres Rios River for Supporting Fisheries and Wildlife.
- 1994 -Manila Community Service District, Humboldt County, California, Facility Plan and Basis for Design of a Pond/Wetland/Infiltration System.
- 1994 -Palo Cedros High School, Shasta County, California-Non-point Source Wetland System for 120 acre development.
- 1994 -**World Bank, PEC DAR** (Palestinian Economic Commission for Development of Reconstruction). Strategy for improving sanitation facilities and reusing effluent for Gaza and the West Bank.
- 1994 -**USAID's Environmental Health Project** (Arlington, Virginia/Low Cost Wastewater Treatment System for Rural Communities in Egypt.
- 1993 -Union Carbide, Seaport, Texas, Use of Free Surface Constructed Wetland to Remove Suspended Solids from Oxidation Pond Effluent - Polyester Plant.
- 1993 -City of Ashland, Oregon, Woodward-Clyde Consultants Wetland Treatment Alternative/Rapid Infiltration Alternative - Facility Plan Amendment.
- 1993 -City of Napa, California - Constructed Wetland Alternatives for Treating Oxidation Pond Effluent - Facility Plan Amendment.

- 1993 -City of Santa Rosa, California - Technical Review Team for EIR Supplement - Wetland Treatment/Habitat Alternative.
- 1993 -**USAID/Mideast Bureau of State Department**, Development of An Interactive Exper Computer Model To Select Appropriate Water and Wastewater Treatment System for Reuse in Developing Countries, Workshop July 25-Aug. 5, 1993 at Newport Beach, California for 17 representatives from Middle East countries.
- 1993 -American Canyon, California, Brown and Caldwell Engineering - Basis for Design for Free Surface Constructed Wetland.
- 1992-93 -**Tennessee Valley Administration/USAID/EPA** Feasibility Plan for Constructed Wetlands in Tata and Fertorakos, Hungary.
- 1992 -Lihi-Lani Recreation Community- Oxidation Pond/Wetlands Wastewater Treatment and Reclamation System, Engineering Concepts, Honolulu, HI.
- 1992 -Kingman, Arizona, Concept Plan for Wetland Treatment for Effluent Polishing - Nitrogen Removal - John Corolla Engineers, Phoenix, Arizona.
- 1992 -**Technical Advisory Panel "Everglades Protection Project** - Phosphorous Removal in Wetlands", Nolte and Associates, Sacramento, CA.
- 1992 -**State of Washington Attorney General**, expertise witness for the state on use of constructed wetland as a viable wastewater treatment alternative - City of Sequim, WA.
- 1992 -American Cyanamid - Niagara Falls, New York - Use of Constructed Wetland to Remove Ammonia Levels of An Industrial Waste Leachate.
- 1991-Present -**Bureau of Reclamation** - Eastern Municipal Water District, Hemet, California - Technical Review Team - Use of Constructed Wetlands In A Total Water Reuse System in Arid Areas.
- 1991-Present -Design, Construction and Study of a Constructed Wetlands Demonstration Project - Sacramento Regional Wastewater Treatment Plant - Nolte and Associates, Sacramento, CA.
- 1991 -City of Davis Wetlands Demonstration Project, Larry Walker and Associates, Davis, CA.
- 1990 -Mount Angel, Oregon, Wetland Treatment System, Westech Engineering, Salem, Oregon.
- 1990 -Eastern Municipal Water District, Hemet, California- Wetland Treatment /Water Reuse/Groundwater Recharge - Bureau of Reclamation Project.
- 1990 -**AAAS- Sub-Saharan Malaria Project-** Committee Member- Contribution Author - An Intersectional Approach to Malaria in Development in Africa.
- 1988 -**Consultant to Peace Corps-Programming Water Supply and Health/Sanitation Volunteer-Pre-service and in-service training courses** - Sierra Leone, Ghana, Nepal, Morocco, Mauritania, and Niger.
- 1980-Present -**Consultant to USAID through Water & Sanitation for Health Project (WASH I & WASH II)-** short term technical assistance training programs in area of rural water supply/sanitation-hygiene education for Indonesia, Belize, Sierra Leone, Kenya, Tanzania, Swaziland, Malawi and Ghana.

SEMINARS AND SHORT COURSES

- 2006 -Lorman Seminar Series., Constructed and Restored Wetlands:: The Future of California Water Quality, San Francisco, California
- 2006 -UAJBO-Oaxaca, Mexico, Constructed Wetland Short Course
- 1996-2004 -Annual Constructed Wetland Workshop, Humboldt State University,
Director and Lead Instructor for a 5 day lecture, laboratory, and fieldwork workshop for engineers, planners, and biologists. Use of Constructed Wetlands for Improved Water Quality-Planning and Design,
- 2001 -Wetland Short Course, Butte Montana, Montana AWWA-WEF Annual Conference
- 1998-1999 -Technology Transfer Workshop, EPA Region 4, Kansas City, Kansas Use of Constructed Wetland to Treat Domestic Effluent.
- 1998 -Constructed Wetland Workshop - Hungarian Ministry of the Environment, Budapest, Hungary, Oct. 11-20. Lead instructor.
- 1992 -Graduate Seminar, Environmental Engineering Department - UC Berkeley, Constructed Wetland - Design Consideration, March 1992.

- 1991 -EPA-Technology Transfer Conference- Denver, Colorado -Design, Construction, and Operations of Constructed Wetlands, Sept. 1991.
- 1991 -EPA-Technology Transfer Conference-Portland, Oregon, June Constructed Wetland Technology.
- 1990 -City of Paradise, California- Constructed Wetland Treatment Systems.
- 1990 -Graduate Seminar Presentation- Civil Engineering Dept., U.C. Davis on Arcata Wetland Treatment System- May 1990.
- 1989 -Wetland Treatment Systems, Anacortes, Washington.
- 1988 -Gearheart, R.A. and George Allen- Co-Director- National Workshop on Wetlands for Wastewater Treatment and Resource Enhancement. August 3-6, 1988. Humboldt State University, Arcata,.

SELECTED PUBLICATIONS AND REPORTS

- Gearheart, R.A., Use of Constructed to Manage Water Quality, Southwest Hydrology, January-March
- Gearheart, R. A. The Use of A Free Surface Constructed Wetland As An Alternative Process Treatment Train To Meet Unrestricted Water Reclamation Standards, *Water Science*, Vol. 40, pp. 375-382, 1999.
- Gearheart, R.A. Criteria for Design of Free Surface Constructed Wetlands Based Upon A Coupled Ecological and Water Quality Model. Presented at the 5th International Conference on Wetland Systems for Water Pollution Control. Vienna, Austria September 15-19, 1996.
- Gearheart, R.A. "Watershed and Lake Management Strategy For Improving Water Quality in Upper Klamath Lake, Oregon". The First Klamath Basin Ecosystem Research and Coordination Meeting, March 14-16, 1995. Sponsored by the Klamath Basin Ecosystem Restoration Office - OIT, Klamath Falls, Oregon.
- Gearheart, R.A., "Using Wetlands for Nitrogen Polishing. Proceedings on Nitrogen, Environment, and People- an International Conference, Everett, WA. 1995.
- Gearheart, R.A. "Watershed-Wetlands-Wastewater Management", Natural and Constructed Wetlands for Wastewater Treatment and Reuse - Experiences, Goals, and Limits, International Seminar, Centro Studi Provincia Perugia, Italy, 26-28 October, 1995.
- Gearheart, R.A., "Eight Years of Full-Scale Operations at a Free-Surface Wetland Treating Domestic Wastewater", 86th Annual American Society of Agronomy/Crop Science Society of America/Soil Science Society of America, Seattle, WA. - Nov. 13-18, 1994.
- Gearheart, R.A. "Use of Constructed Wetlands to Treat Domestic Wastewater - City of Arcata, California," *Water. Science. Technology* ,Vol. 26. No. 7-8 pp 1625-1637, 1992.
- Gearheart, R.A. "Phosphorus Removal in Constructed Wetlands", presented at the 66th WEF Annual Conference, Anaheim, California, October 3-7, 1993.
- Gearheart, R.A. et al., Metals Literature Review - Wetland Process, submitted to Union Sanitary District East Bay Dischargers Authority and East Bay Regional Park District, 128 pages. February 1992.
- Gearheart, R.A. et al., "Integrated Site Metals Data and Implications for Food Web Toxicity, Hayward Marsh, Union Sanitary District, East Bay Dischargers, and East Bay Regional Park District, 125 pages, February 1992.
- Gearheart, R.A. and George Waller, "An Overview of Potential Wetland Opportunities in the Malibu Creek Watershed", prepared for Marsh System Subcommittee, Malibu Regional Wastewater Systems Citizen Committee, August 1989.
- Gearheart, R.A., "Constructed Open Surface Wetlands: Water Quality Benefits and Wildlife Benefits, City of Arcata, California", International Conference on Constructed Wetlands for Water Quality Improvement. University of West Florida, Pensacola, Florida, October 1991. Proceedings in print.
- Gearheart, R.A., "Nitrogen Cycle in Constructed Wetlands", 1991 Annual WEF Conference, Washington, D.C. Manuscript in progress.
- Gearheart, R.A., Community Based Maintenance and Cost Recovery of Piped Rural Water Schemes- Malawi, WASH Report No. 309.
- Gearheart, R.A., "Criteria for Selection Low Cost Water and Wastewater Technology for Developing Country," Symposium on African Water Supply- Sponsored by Atlanta University/USAID, Atlanta, Georgia, May 6-9, 1987.
- Gearheart, R. A. and Brad Finney, "Utilization of Wetlands As A Reliable Low Cost Wastewater Treatment Process". Proceedings of the Aquatic Plants for Water Treatment and Resource Recovery Conference, Orlando, Florida, July 1986.

HONORS AND AWARDS

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| 2002 | Specially Recognized Alumnus Biology Department-North Texas University, Denton, Texas |
| 1998 | American Society of Civil Engineers Northcoast Section-Engineer of the Year |
| 1989 | -Scholar of the Year - Humboldt State University. |
| 1988 | -Boston Visions - 2nd Place Award for a solution to Boston Harbor's water quality problems - use of wetlands to treat point and non-point source pollution affording recreational opportunities in an urban setting - Boston Society of Architecture and Boston's Redevelopment Agency. |
| 1986 | -Meritorious Service Award - Humboldt State University |
| 1987 | -Ford Foundation Award - Part of the City of Arcata's Task Force (1978-1986). Resulting in the Arcata Marsh and Wildlife Sanctuary - Principal Engineer on the project. \$100,000 award. |